UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,997	02/16/2006	Kazuhiko Honda	52433/837	1770

26646 7590 01/19/2011
KENYON & KENYON LLP
ONE BROADWAY
NEW YORK, NY 10004

EXAMINER	
ZHU, WEIPING	

ART UNIT	PAPER NUMBER
1734	

MAIL DATE	DELIVERY MODE
01/19/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,997	HONDA ET AL.	
	Examiner	Art Unit	
	WEIPING ZHU	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/18/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 13, 2010 has been entered.

Status of Claims

2. Claims 1-3 are currently under examination wherein claim 1 has been amended in applicant's amendment filed on May 13, 2010.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP ('412 A) in view of Nitto et al. (US 4,437,905).

With respect to claim 1, JP ('412 A) discloses a process for producing a high strength galvanized steel sheet comprising hot-dip galvanizing a high strength steel sheet having by weight 0.4-2.0% of Si (abstract and claim 1) in an atmosphere introduced into a reducing zone containing by weight 1-70% of hydrogen and the

balance comprising N_2 and H_2O; controlling in the atmosphere the log (PH_2O/PH_2) of the water partial pressure and hydrogen partial pressure to log (PH_2O/PH_2) ≤ -0.8 (paragraphs [0022]-[0023], machine translation); annealing the steel sheet; cooling the steel sheet by a plating bath; and heating for alloying the steel sheet at 460-550°C (paragraphs [0029]-[0032], machine translation). The log (PH_2O/PH_2) disclosed by JP ('412 A) overlaps the claimed range of (PH_2O/PH_2) ≤ -0.5. A prima facie case of obviousness exists. See MPEP 2144.05 I. JP ('412 A) further discloses the process is carried out in a continuous system hot-dipping line comprising an oxidizing zone, a reducing zone and a plating zone (paragraphs [0021]-[0027]). The reducing and plating zones of the continuous system hot-dipping line as disclosed by JP ('412 A) obviously read on the claimed apparatus limitation of an all radiant tube type annealing furnace without an oxidizing zone wherein the annealing and plating are carried out. JP ('412 A) does not specify the atmosphere introduced into the reducing zone comprises CO_2, O_2 and CO as claimed. Nitto et al. ('905) discloses the presences of CO_2 (2.3% by volume), O_2, CO in a continuous annealing atmosphere introduced into a reducing zone in a continuous annealing furnace (col. 7, line 1 to col. 8, line 40). It would have been obvious to one of ordinary skill in the art that these gases would be present in the atmosphere introduced into the reducing zone of JP ('412 A), because the processes of annealing of JP ('412 A) and Nitto et al. ('905) are similar and are carried out in similar apparatus. The content of CO_2 (2.3% by volume) disclosed by Nitto et al. ('905) appears to be within the claimed CO_2 content range of 1-100 wt%. JP ('412 A) does not disclose controlling log (PCO_2/PH_2) and log (P_T/PH_2) as claimed. However, it has been

held that discovering an optimum value of a result-effective variable involves only routine skill in the art; see *In re Boesch*, 617, F.2d 272, 205 USPQ 215 (CCPA 1980). In the instant case, the partial pressures of H_2, H_2O, CO_2 and CO are result effective variables, because they would directly affect the intensities of the oxidation and reduction of the steel sheet as disclosed by Nitto et al. ('905) (col. 7, line 1 to col. 8, line 6). The claimed total pressure would be a result-effective variable too because it is the sum of the partial pressures of H_2O and CO_2. It would have been obvious to one skilled in the art to have optimized the log (PCO_2/PH_2) and log (P_T/PH_2) in the reducing zone of JP ('412 A) in order to achieve desired intensities of the oxidation and reduction of the steel sheet as disclosed by Nitto et al. ('905) (col. 8, lines 3-6). JP ('412 A) does not specify the annealing temperature as claimed. Nitto et al. ('905) discloses an annealing temperature of from 700°C to the Ac_3 point (abstract), which overlaps the claimed temperature range.

With respect to claims 2 and 3, JP ('412 A) discloses that the plating bath contains 0.05-0.25 Al (paragraph [0024], machine translation), which overlaps the Al content in the plating bath as claimed in claims 2 and 3. The alloying temperature of JP ('412 A) would obviously satisfy the claimed formula because both the alloying temperature and the Al content as disclosed by JP ('412 A) overlap the claimed alloying temperature and the Al content respectively.

Response to Arguments

4. The applicant's arguments filed on May 13, 2010 have been fully considered but they are not persuasive.

First, the applicant argues that both JP ('412 A) and Nitto et al. ('905) teach a conventional production process including a step of oxidizing and a step of reducing in a reducing zone having an atmosphere of N_2 and H_2, which is different from the instant invention using an all radiant tube furnace without an oxidizing zone. In response, the examiner notes that it appears that both JP ('412 A) and Nitto et al. ('905) use the same atmosphere of a gaseous combustion product containing H_2, H_2O, N_2, O_2, CO_2 and CO in the oxidizing zone and reducing zone because the direction and intensity of the reaction can be controlled as desired by changing the reaction temperature and the PH_2O/PH_2 and PCO_2/PCO as disclosed by Nitto et al. ('905) (col. 7, line 32 to col. 8, line 6). It is noted that the instant claim 1 does not exclude the oxidizing step before the annealing step. Actually, as indicated in the instant specification (lines 24-31, page 7), an oxide film is produced at the surface of the steel sheet before the annealing. The reducing zone of the continuous system hot-dipping line as disclosed by JP ('412 A) or Nitto et al. ('905) obviously reads on the claimed apparatus limitation of an all radiant tube type annealing furnace without an oxidizing zone. The process of JP ('412 A) in view of Nitto et al. ('905) satisfying all the claimed limitations as discussed above renders the claimed process obvious to one of ordinary skill in the art.

Second, the applicant argues that JP ('412 A) does not teach adding CO_2 to the reduction atmosphere and to control the conditions such as PH_2O/PH_2 to promote internal oxidation of SiO_2; and JP ('412 A) only teaches controlling PH_2O/PH_2 in the reducing zone, therefore, the process of JP ('412 A) cannot be used in the claimed all radiant furnace. In response, the examiner notes that as discussed above JP ('412 A) in

view of Nitto et al. ('905) does teach adding CO_2 to the reduction atmosphere and controlling PT/PH_2 therein. JP ('412 A) also teaches controlling the PH_2O/PH_2 in the reducing atmosphere to promote internal oxidation of SiO_2 (paragraphs [0022] and [0023]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the process of JP ('412 A) in view of Nitto et al. ('905) in the claimed all radiant furnace with an expectation of success because the claimed and JP ('412 A) in view of Nitto et al. ('905)'s processes are substantially identical and the claimed all radiant furnace reads on the reducing zone of the continuous system hot-dipping line of JP ('412 A) in view of Nitto et al. ('905).

Third, the applicant argues that Nitto et al. ('905) does not teach adding O_2, CO_2 and CO to the reducing atmosphere. In response, see the examiner's response to applicant's 1st argument above. It is noted that the disclosure of Nitto et al. ('905) that a reducing atmosphere contains 4% or more of hydrogen gas with the balance consisting of nitrogen gas (col. 9, lines 58-62) is preferred to rapidly reduce the oxide layer within a time of form 10-120 seconds does not exclude the presences of O_2, CO_2 and CO in the reducing atmosphere.

Conclusions

5. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emily Le can be reached on 571-272-0903. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Weiping Zhu/
Examiner, Art Unit 1734

1/13/2011